

CORRECTED VERSION

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
26 May 2005 (26.05.2005)

PCT

(10) International Publication Number
WO 2005/046862 A1

(51) International Patent Classification⁷: **B01J 20/04**,
20/34, B01D 53/62

(21) International Application Number:
PCT/CA2003/001759

(22) International Filing Date:
14 November 2003 (14.11.2003)

(25) Filing Language: English

(26) Publication Language: English

(71) Applicant (for all designated States except US): **HER MAJESTY THE QUEEN IN RIGHT OF CANADA AS REPRESENTED BY THE MINISTER OF NATURAL RESOURCES** [CA/CA]; 580 Booth Street, 16th Floor, Ottawa, Ontario K1A 0E4 (CA).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **ANTHONY**, Edward, J. [GB/CA]; 256 Second Avenue, Ottawa, Ontario

K1S 2H9 (CA). **LU, Dennis** [CA/CA]; 76 Blackdome Crescent, Ottawa, Ontario K2T 1B1 (CA). **SALVADOR, Carlos** [CA/CA]; 25 Woodridge Crescent, Apt. 1215, Ottawa, Ontario K2B 7T4 (CA).

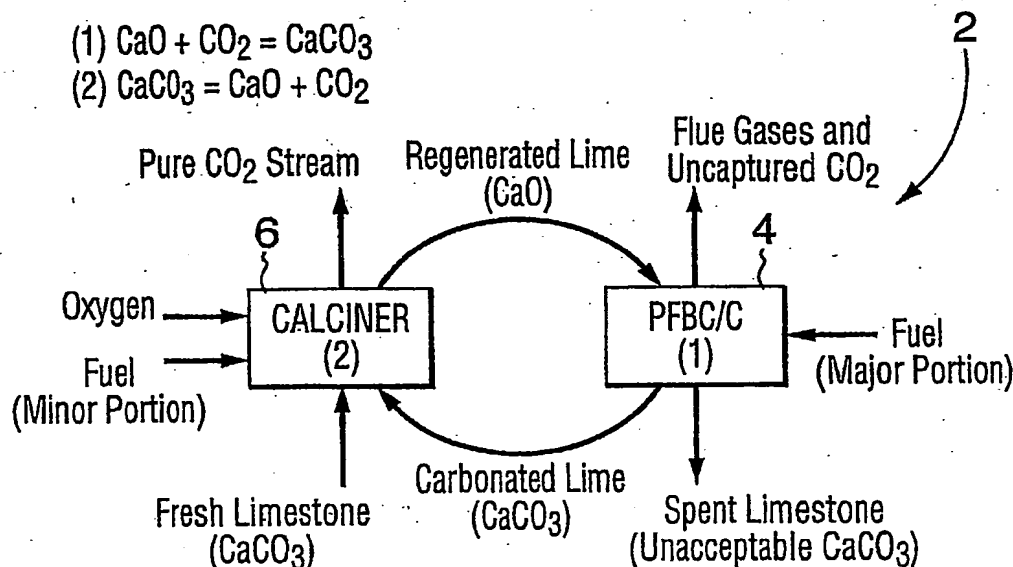
(74) Agents: **WILKES, Robert, A.** et al.; Shapiro Cohen, P.O. Box 3440, Station D, Ottawa, Ontario K1P 6P1 (CA).

(81) Designated States (national): AB, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (regional): ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,

[Continued on next page]

(54) Title: REACTIVATION OF LIME-BASED SORBENTS BY CO₂ SHOCKING



(57) Abstract: The present invention discloses a method and an apparatus for reactivating lime-based sorbents and increasing the carbon dioxide-capture capacity of the sorbent in the combustion of carbon-containing fuels. The method of the present invention seeks to increase the carbon dioxide capture capacity of lime-based sorbents by applying concentrated or 100% carbon dioxide directly to a lime-based sorbent. Optionally, the lime-based sorbent may be pretreated using a hydration process after each process of carbon dioxide separation. The regenerated sorbent is carbonated in a presence of concentrated carbon dioxide and elevated temperatures. The invention is useful in reducing the need to add additional sorbent to maintain the carbonation/calcination cycle. The regenerative potential of the sorbent as manifested by the present invention leads to increased carbon dioxide-capture capacity of the sorbent.

WO 2005/046862 A1



ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE,
SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA,
GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(48) Date of publication of this corrected version:

4 August 2005

Declaration under Rule 4.17:

— of inventorship (Rule 4.17(iv)) for US only

Published:

— with international search report

(15) Information about Correction:

see PCT Gazette No. 31/2005 of 4 August 2005, Section II

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
26 May 2005 (26.05.2005)

PCT

(10) International Publication Number
WO 2005/046862 A1

(51) International Patent Classification⁷: **B01J 20/04,**
20/34, B01D 53/62

Crescent, Ottawa, Ontario K2T 1B1 (CA). SALVADOR,
Carlos [CA/CA]; 25 Woodridge Crescent, Apt. 1215,
Ottawa, Ontario K2B 7T4 (CA).

(21) International Application Number:
PCT/CA2003/001759

(74) Agents: WILKES, Robert, A. et al.; Shapiro Cohen, P.O.
Box 3440, Station D, Ottawa, Ontario K1P 6P1 (CA).

(22) International Filing Date:
14 November 2003 (14.11.2003)

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,
CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE,
GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR,
KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK,
MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT,
RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR,
TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(25) Filing Language: English

(26) Publication Language: English

(71) Applicant (*for all designated States except US*): HER
MAJESTY THE QUEEN IN RIGHT OF CANADA AS
REPRESENTED BY THE MINISTER OF NATURAL
RESOURCES [CA/CA]; 580 Booth Street, 16th Floor,
Ottawa, Ontario K1A 0E4 (CA).

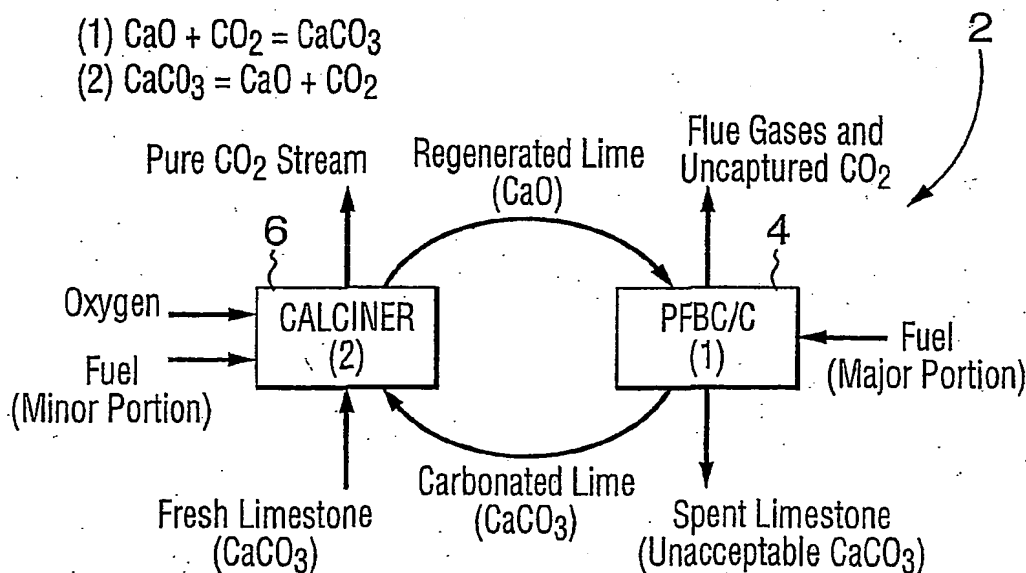
(84) Designated States (*regional*): ARIPO patent (BW, GH,
GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE,
SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA,
GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(72) Inventors; and

(75) Inventors/Applicants (*for US only*): ANTHONY, Ed-
ward, J. [GB/CA]; 256 Second Avenue, Ottawa, Ontario
K1S 2H9 (CA). LU, Dennis [CA/CA]; 76 Blackdome

[Continued on next page]

(54) Title: REACTIVATION OF LIME-BASED SORBENTS BY CO₂



(57) Abstract: The present invention discloses a method and an apparatus for reactivating lime-based sorbents and increasing the carbon dioxide-capture capacity of the sorbent in the combustion of carbon-containing fuels. The method of the present invention seeks to increase the carbon dioxide capture capacity of lime-based sorbents by applying concentrated or 100% carbon dioxide directly to a lime-based sorbent. Optionally, the lime-based sorbent may be pretreated using a hydration process after each process of carbon dioxide separation. The regenerated sorbent is carbonated in a presence of concentrated carbon dioxide and elevated temperatures. The invention is useful in reducing the need to add additional sorbent to maintain the carbonation/calcination cycle. The regenerative potential of the sorbent as manifested by the present invention leads to increased carbon dioxide-capture capacity of the sorbent.



Declaration under Rule 4.17:

— of inventorship (Rule 4.17(iv)) for US only

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.